

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 48-50, 54-59, and 74-77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satoh et al, US Patent Application Publication 2002/0011210 A1, in view of Ogawa et al, US Patent Application Publication 2007/0062646 A1.

Satoh et al et al teaches a process chamber 112 that includes: a substrate holder 120; a first inlet 140 leading directly into the process chamber positioned on one side of the substrate holder; an outlet 142 positioned at an opposite side of the substrate holder from the first inlet, and defines a laminar flow path between the first inlet 140 and outlet 142; a second inlet 16 leading directly into the processing chamber positioned to open

into the laminar flow path between the first inlet and the substrate holder; a remote plasma generator 13; and a channeling duct 14 configured to channel the plasma generator product to the inlet. (Figure 5)

Satoh et al differs from the present invention in that Satoh et al does not teach: a plate (inlet insert) to disrupt a reactive flow flowing through the second inlet into the process chamber, the inlet plate having an elongate axis, the plate comprising a flow blocking section, the plate further comprising a single opening having an elongate shape extending substantially along the elongate axis, wherein the opening is wider in a dimension perpendicular to the elongate axis at at least one portion of the axis than other portions of the axis; the second inlet having a throat and a mouth, the mouth having a larger circumference than the throat; the location of the inlet insert; the shape of the second inlet; or various shapes of the flow blocking section or opening.

Ogawa et al teaches a processing apparatus that includes a remote plasma source 55 connected to a processing chamber 41 via an inlet having a throat where the reactive flow enters the inlet and a mouth with a larger circumference where the reactive flow exits the inlet, and a plate 57 (figure 7A) configured to disrupt a reactive flow flowing through the second inlet into the process chamber, the inlet plate having an elongate axis, the plate comprising a flow blocking section (material of plate 57), the plate further comprising a single opening 58 having an elongate shape extending substantially along the elongate axis, wherein the opening is wider in a dimension perpendicular to the elongate axis at at least one portion of the axis than other portions of the axis (the dimension of the center parallel portion of opening 58 is larger than the

dimension of the rounded ends) provide a dimension smaller than the . (Figures 6-7A)

The flow geometry is dependent on the process and processing chamber. Uniform flow geometry is used for forming uniform layers on the substrate. Non-uniform flow geometry is used to compensate for reaction gas depletion and non-uniform thermal or gas flow conditions. The location of the inlet insert plate with respect to the mouth of the inlet, the shape and arrangement of the opening and blocking portions, and the shape of the showerhead are all factors in the flow geometry and are used to optimize the flow geometry.

The motivation for adding the throat and mouth of Ogawa et al to the apparatus of Satoh et al, and optimizing the opening and blocking portions, location of the plate, and shape of the inlet is to optimize the flow geometry of the inlet and inlet insert to create the desired flow geometry.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to add the throat and mouth of Ogawa et al and optimize the size and shape of the opening and blocking portions, the location of the plate, and the shape of the showerhead to form the desired flow geometry.

Response to Arguments

4. Applicant's arguments filed January 25, 2008 have been fully considered but they are not persuasive.

Upon further review of Ogawa et al, it was discovered that the opening 58 in plate 57 of Figure 7A reads on the claimed inlet plate as discussed above. Thus, Ogawa et al teaches the claimed inlet plate.

In regard to the argument that:

“Because the second inlet adds a gas flow to the laminar flow path, there is a need for adjusting the flow in a desired fashion when cleaning the reaction chamber or processing a substrate in the chamber. Such a need would not have been appreciated by one of ordinary skill in the art in view of the art of record.”

The Examiner disagrees. In CVD coating and dry etching apparatus the flow of gas is critical to the uniformity of the process. This is well known in the art. Modifying the gas inlet to optimize the flow geometry is a critical part of the design process. One of ordinary skill in the art would recognize that the flow geometry can be varied by changing the shape of the gas inlet and gas inlet plate. Ogawa et al teaches the plate claimed in claim 48 and it would be obvious to modify the shape of the opening as needed to provide the desired flow geometry.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrie R. Lund whose telephone number is (571) 272-1437. The examiner can normally be reached on Monday-Thursday (10:00 am - 9:00 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jeffrie R. Lund/
Primary Examiner
Art Unit 1792

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